

IN THE CLAIMS:

Claims 1-4, 6, 7, 9, 11-22, 24, 25, 27, and 29 have been amended herein. Please cancel claims 5, 8, 10, 23, 26, and 28 without prejudice or disclaimer. Please note that all claims currently pending and under consideration in the referenced application are shown below. Please enter these claims as amended. This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently amended) A method of preparing a thermoplastic elastomer elastomer, comprising:

(a) — dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups at approximately stoichiometric ratios intended to be present in the thermoplastic elastomer into solution comprising at least one non-halogenated solvent into a solution comprising at least one non-halogenated solvent selected from the group consisting of at least one organic ether, at least one organic ester, and at least one organic ketone, the A blocks being crystalline below about 75°C and derived from monomers comprising at least one member selected from the group consisting of oxetane derivatives and tetrahydrofuran derivatives, the B blocks being amorphous above about -20°C and derived from monomers comprising at least one member selected from the group consisting of oxetane and derivatives thereof, tetrahydrofuran and derivatives thereof, and oxirane and derivatives thereof;

(b) — drying the dissolved A blocks and the dissolved B blocks of water by azeotropic distillation of the at least one non-halogenated solvent;

(c) — end-capping the dried A blocks and the dried B blocks in the at least one non-halogenated solvent by reacting the dried A blocks and the dried B blocks with at least one diisocyanate in which a first isocyanate moiety thereof is substantially more reactive with the terminal groups of the A blocks and the B blocks as than a second isocyanate moiety thereof, whereby wherein the more reactive first isocyanate moiety is capable of reacting with the

terminal groups of the A blocks and the B blocks, leaving the less reactive second isocyanate moiety free and unreacted; and

(d) linking the end-capped A blocks and the end-capped B blocks together in the at least one non-halogenated solvent with at least one linking compound comprising two isocyanate-reactive groups which are sufficiently sterically unhindered to react with the free and unreacted isocyanate moieties of the end-capped A blocks and the endcapped B blocks.

2. (Currently amended) A-The method as defined in claim 1, wherein said-dissolving (a)-A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises separately dissolving the A blocks and the B blocks into respective solutions.

3. (Currently amended) A-The method as defined in claim 2 claim 1, wherein said end-capping (e)-the dried A blocks and the dried B blocks in the at least one non-halogenated solvent comprises separately end-capping the A blocks and the B blocks in the respective solutions.

4. (Currently amended) A-The method as defined in claim 1, wherein said (a), (b), (c), and (d) dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution, drying the dissolved A blocks and the dissolved B blocks, end-capping the dried A blocks and the dried B blocks, and linking the end-capped A blocks and the end-capped B blocks are conducted in the absence of any-a halogenated solvent.

Claim 5 (Canceled)

6. (Currently amended) A-The method as defined in claim 5 claim 1, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks in the-an organic ether that comprises one or more members at least one member selected from the group consisting of tetrahydrofuran, ethylene glycol dimethyl ether, and 1 ,4-dioxane.

7. (Currently amended) ~~A-The method as defined in claim 6~~ claim 1, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks in the organic ether ~~comprises tetrahydrofuran.~~

Claim 8 (Canceled)

9. (Currently amended) ~~A-The method as defined in claim 8~~ claim 1, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks in the organic ester ~~comprises ethyl acetate.~~

Claim 10 (Canceled)

11. (Currently amended) ~~A-The method as defined in claim 10~~ claim 1, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks in the organic ketone ~~comprises methyl ethyl ketone.~~

12. (Currently amended) ~~A-The method as defined in claim 1, wherein linking the end-capped A blocks and the end-capped B blocks together in the at least one non-halogenated solvent with at least one linking compound comprises linking the end-capped A blocks and the end-capped B blocks with at least one the linking compound is derived from at least one diisocyanate and at least one difunctional urethane oligomer comprising two functional groups which are reactive with isocyanate moieties of the at least one diisocyanate.~~

13. (Currently amended) A-The method as defined in claim 1, wherein:
end-capping the dried A blocks and the dried B blocks in the at least one non-halogenated solvent with at least one diisocyanate comprises end-capping the dried A blocks and the dried B blocks with at least one diisocyanate in which the first isocyanate moiety of the diisocyanate is at least five times more reactive with the terminal groups of each of the A blocks and the B blocks as the second isocyanate moiety, whereby wherein the more reactive first isocyanate moiety is capable of reacting with and end capping the terminal groups of the A blocks and the B blocks, leaving the less reactive second isocyanate moiety free and unreacted; and

linking the end-capped A blocks and the end-capped B blocks together in the at least one non-halogenated solvent with at least one linking compound comprises linking the end-capped A blocks and the end-capped B blocks with the at least one linking compound that has two isocyanate-reactive hydroxyl groups which are sufficiently sterically unhindered to be reactive with the free and unreacted second isocyanate groups of the end-capped blocks.

14. (Currently amended) A-The method as defined in claim 1, wherein end-capping the dried A blocks and the dried B blocks comprises reacting the dried A blocks and the dried B block with the a diisocyanate that comprises toluene diisocyanate.

15. (Currently amended) A-The method as defined in claim 1, wherein the thermoplastic elastomer has a weight average molecular weight of at least 40,000 and a number average molecular weight of at least 10,000.

16. (Currently amended) A-The method as defined in claim 1, wherein the thermoplastic elastomer has a weight average molecular weight of at least 60,000 and a number average molecular weight of at least 12,000.

17. (Currently amended) A-The method as defined in claim 1, wherein the thermoplastic elastomer has a weight average molecular weight of at least 80,000 and a number average molecular weight of at least 15,000.

18. (Currently amended) A-The method as defined in claim 1, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks terminated with respective hydroxyl groups as the isocyanate-reactive terminal groups of the A and B blocks are hydroxyl groups into a solution.

19. (Currently amended) A method of making an energetic composition, comprising:

(a) — dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprising at least one non-halogenated solvent selected from the group consisting of at least one organic ether, at least one organic ester, and at least one organic ketone, at approximately stoichiometric ratios intended to be present in the thermoplastic elastomer into solution comprising at least one non-halogenated solvent, the A blocks being crystalline below about 75°C and derived from monomers comprising at least one member selected from the group consisting of oxetane derivatives and tetrahydrofuran derivatives, the B blocks being amorphous above about -20°C and derived from monomers comprising at least one member selected from the group consisting of oxetane and derivatives thereof, tetrahydrofuran and derivatives thereof, and oxirane and derivatives thereof;

(b) — drying the dissolved A blocks and the dissolved B blocks of water by azeotropic distillation of the at least one non-halogenated solvent;

(c) — end-capping the dried A blocks and the dried B blocks in the at least one non-halogenated solvent by reacting the dried A blocks and the dried B blocks with at least one diisocyanate in which a first isocyanate moiety thereof is substantially more reactive with the terminal groups of the A blocks and the B blocks as than a second isocyanate moiety thereof, whereby wherein the more reactive first isocyanate moiety is capable of reacting with the terminal groups of the A blocks and the B blocks, leaving the less reactive second isocyanate moiety free and unreacted;

(d) — linking the end-capped A blocks and the end-capped B blocks together in the at least one non-halogenated solvent with at least one linking compound comprising two isocyanate-reactive groups which are sufficiently sterically unhindered to react with the free and unreacted isocyanate moieties of the end-capped A blocks and the end-capped B blocks; and
(e) — blending the thermoplastic elastomer with about 50 wt% to about 95 wt% of at least one solid selected from the group consisting of fuel particulates and oxidizer particulates.

20. (Currently amended) A-The method as defined in claim 19, wherein said dissolving (a) A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises separately dissolving the A blocks and the B blocks into respective solutions.

21. (Currently amended) A-The method as defined in claim 20, wherein said end-capping (e) the dried A blocks and the dried B blocks in the at least one non-halogenated solvent comprises separately end-capping the A blocks and the B blocks in the respective solutions.

22. (Currently amended) A-The method as defined in claim 19, wherein said (a), (b), (c), and (d) dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution, drying the dissolved A blocks and the dissolved B blocks, end-capping the dried A blocks and the dried B blocks, and linking the end-capped A blocks and the end-capped B blocks are conducted in the absence of any a halogenated solvent.

Claim 23 (Canceled)

24. (Currently amended) A-The method as defined in claim 23 claim 19, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks into at least one the organic ether ~~comprises one or more members selected from the group consisting of tetrahydrofuran, ethylene glycol dimethyl ether, and 1,4-dioxane.~~

25. (Currently amended) A-The method as defined in claim 23 claim 19, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks into the organic ether comprises tetrahydrofuran.

Claim 26 (Canceled)

27. (Currently amended) A-The method as defined in claim 26, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks into the organic ester comprises ethyl acetate.

Claim 28 (Canceled)

29. (Currently amended) A-The method as defined in claim 28, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks into the organic ketone comprises methyl ethyl ketone.

30. (Previously Presented) A method of making a rocket motor propellant comprising making an energetic composition as defined in claim 19.

31. (Previously Presented) A method of making a gun propellant comprising making an energetic composition as defined in claim 19.

32. (Previously Presented) A method of making an explosive comprising making an energetic composition as defined in claim 19.

33. (Previously Presented) A method of making a gasifier comprising making an energetic composition as defined in claim 19.